



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/577,748

06/18/2007

Andre Feugier

12418/6

2865

23280 7590 02/16/2011  
Davidson, Davidson & Kappel, LLC  
485 7th Avenue  
14th Floor  
New York, NY 10018

EXAMINER

ROYSTON, ELIZABETH

ART UNIT

PAPER NUMBER

1747

MAIL DATE

DELIVERY MODE

02/16/2011

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/577,748	<b>Applicant(s)</b> FEUGIER ET AL.	
	<b>Examiner</b> Elizabeth Royston	<b>Art Unit</b> 1791	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 April 2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 18-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 18-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/21/2010</u> .   | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/5/2010 has been entered.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 18-34 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Specifically, the limitations in claim 18 of "the particulate material is not sieved before shaping" and "no binder is added to the powder of the particulate material before shaping" are not supported by the specification. The method step of specifically not sieving before shaping is not disclosed by Applicant and furthermore the concept of a binder, present or not, is not disclosed by the specification.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 18, 20, 21, and 27-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gradel (US PN 6808656 B2).

With regard to claims 18, 20 and 21, Gradel teaches a method for manufacturing nuclear fuel pellets through sintering of a material containing uranium dioxide obtained from a powder originating from a process for a dry route conversion of uranium hexafluoride comprising, obtaining the powder direction by the uranium hexafluoride dry route conversion process, placing the powder in a vessel containing moving, compressing, and mixing bodies (col. 11, line 40-42, where milling and mixing would intrinsically require some form of "vessel" capable of both mixing and milling, and where

Art Unit: 1791

the process of milling intrinsically requires compression), shaping the particulate material obtained by agitation in the vessel into raw fuel pellets that undergo sintering.

Although Gradel does not explicitly disclose specific process steps where the particulate material is not sieved before shaping or that no binder is added to the powder of the particulate material before the shaping, one of ordinary skill in the art at the time of the invention would appreciate that since no mention of a binder or sieving is made that Gradel has not disclosed the inclusion of such explicit steps in the process.

Although Gradel does not explicitly disclose agitating the vessel such that the powder moves within a volume of the vessel in three noncoplanar axes to be compressed between moving bodies and walls of the vessel to form a particulate material, since Gradel teaches milling as an option for forming particulate material, and since a milling device intrinsically requires that the powder move within a volume of the vessel in three noncoplanar axes to be compressed between some form of moving bodies and walls of the vessel, the teaching of Gradel is found to read on applicant's claimed invention. Furthermore, although Gradel is silent as to the density of the material, since Gradel teaches the final desired particle size (col. 7, line 35) within the same range as the particle size of the same uranium oxide material made by the same method as disclosed by applicant (specification, page 4, line 4-5), then the densities and properties of the pre-milled and post-milled particles in the teaching of Gradel must have been within the density ranges claimed by applicant.

Art Unit: 1791

With regard to claims 27 and 33, Gradel teaches adding a lubricant and a pore-forming agent to the powder obtained by the dry route conversion process (col. 8, line 60-64, col. 12, line 14-19, where the lubricant and agent can optionally be added to the powder prior to further treatment and the mixed lubricant will intrinsically act to lubricate the particulate material as per its intended function). Although Gradel is silent as to the exact amount of pore-forming agent added, Gradel teaches that the amount required is a result effective variable based on the desired porosity/density of the sintered body (col. 12, line 16-18). It would have been obvious to one of ordinary skill in the art at the time of the invention to optimize the amount of pore-forming agent added to the powder based upon the final desired density of the sintered body.

With regard to claims 28-31, Gradel teaches adding  $U_3O_8$  (col. 11, line 12) to the uranium dioxide powder obtained from the dry-route conversion process (col. 11, line 10-11) prior to milling (col. 11, line 39-42).

With regard to claims 32 and 24, although Gradel teaches the addition of  $PuO_2$  (col. 11, line 21-25) to the powder prior to milling and shaping (col. 11, line 39-41; col. 12, line 20), Gradel does not explicitly disclose placing the vessel in a confinement enclosure or that the vessel is controlled from outside the containment enclosure.

However, since uranium and plutonium are known nuclear hazardous materials, and since milling, especially the milling of dry materials, is known to result in small particulates which are able to take to the air as dust, it would have been obvious to one

Art Unit: 1791

of ordinary skill in the art at the time of the invention to confine the process of manufacturing fuel pellets within an enclosure that would prevent the contamination of both the workers and the environment from harmful radioactive materials.

7. Claim 19 is in the alternative rejected under 35 U.S.C. 103(a) as being unpatentable over Gradel (US PN 6808656 B2), as applied for claims 18, 20, 21, 27-34 above, and in further view of Sutcliffe (US PN 4284593).

With regard to claim 19, Sutcliffe teaches that vibratory ball milling of nuclear fuel materials for periods of time between 1 and 600 minutes (col. 6, line 37) was known in the art at the time of the invention for comminuting (col. 1-2, line 66-68, 1-4) uranium oxide fuel materials (col. 4, line 49-52).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the vibratory ball milling in the teaching of Sutcliffe as the milling process in the teaching of McCoy in view of Hayes as vibratory ball milling predictably results in the formation of successfully milled uranium oxide powder (col. 1, line 66-67, col. 4, line 52) suitable for pressing into the shape of fuel pellets (col. 2, line 38-42).

8. Claims 22, 23, 25, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gradel (US PN 3579311), as applied for claims 18, 20, 21, 27-34 above, and in further view of Hayes (US PN 4643873).

With regard to claims 22, 23, 25, 26, Gradel is silent with regard to the operating parameters of the mill or the physical properties of the moving bodies.

Art Unit: 1791

Hayes teaches a method of milling a uranium dioxide material for fuel pellets by milling the powder for a time between 1 and 600 minutes in a vessel using moving bodies comprising simple geometrically shaped spherical steel balls (col. 2, line 34-37, col. 3, line 35).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the moving bodies in the teaching of Hayes in the mill in the teaching of Gradel. The rationale to do so would have been the motivation provided by the teaching of Hayes, that to use such a moving body while milling predictably results in the formation of an agitated powder with a complete break down of the three dimensional lattice of the particles into individual crystallites (Hayes, col. 2, line 34-37) which prevents the collapse of the particles under the pressure of pellet compaction (Hayes, col. 1, line 61-64), where Gradel also teaches that a dry route conversion process also contains crystallites and that such crystallites are desirably small (Gradel, col. 7, line 35-38).

9. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gradel (US PN 6808656 B2) in view of Hayes (US PN 4643873), as applied for claims 22, 23, 25 and 26 above, and in further view of Zimmerman (US PN 5238304).

With regard to claim 24, Gradel in view of Hayes does not explicitly disclose cylindrical grinding media.



Zimmermann teaches that spherical and cylindrical grinding media were known in the art at the time of the invention as grinding media for vibrating ball millers (col. 2, line 17-27).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the cylindrical grinding media in the teaching of Zimmermann as the grinding media in the method of McCoy in view of Hayes. The rationale to do so would have been the motivation provided by the teaching of Zimmermann, that to use such a grinding media shape predictably results in the selection of a grinding media well suited to activities such as pulverizing materials or preventing loss of material in vibrating ball mills depending on the operational parameters (col. 2, line 20-26).

10. Claims 32 and 34 are in the alternative rejected under 35 U.S.C. 103(a) as being unpatentable over Gradel (US PN 6808656 B2), as applied for claims 18, 20, 21, 27-31, and 33 above, and in further view of Vandergheynst (US PN 2006/0188053 A1).

In the alternative with regard to claims 32 and 34, although Gradel teaches the addition of  $\text{PuO}_2$  (col. 11, line 21-25) to the powder prior to milling and shaping (col. 11, line 39-41; col. 12, line 20), Gradel does not explicitly disclose placing the vessel in a confinement enclosure or that the vessel is controlled from outside the containment enclosure.

Vanderghyeyst teaches that minimizing contact of radioactive materials such as uranium oxide and plutonium oxide (paragraph 4, line 5) is accomplished through enclosing and shielding the radioactive materials and operations within containment

Art Unit: 1791

enclosures, in addition to mechanizing and automating most if not all of the process (paragraph 5). If the processes were mechanized, since the goal of the mechanization and enclosures was to minimize human contact with the radioactive material, it would have been obvious to one of ordinary skill in the art at the time of the invention to place the controls for the mechanized processes outside of the enclosure.

It would have been obvious to one of ordinary skill in the art at the time of the invention to confine the radioactive material and operations in the teaching of Gradel in containment enclosures as in the teaching of Vandergheynst. The rationale to do so would have been the motivation provided by the teaching of Vandergheynst, that to use such enclosures predictably results a minimized direct human intervention on the process and therefore increased safety (paragraph 5, line 1-2, 8-9).

### ***Response to Arguments***

11. Applicant's arguments filed 4/5/2010 have been fully considered but they are not persuasive.

With regard to applicant's argument that there is support for not sieving prior to shaping in the specification, the examiner respectfully disagrees. Applicant appears to include the concept of "a sieve" as part of their process (specification, page 13, line 13-14), where the grid is found to read on a sieve since such a grid would have all of the properties of a sieve with regard to separating out any particulate material too large to pass through the grid.

Art Unit: 1791

With regard to applicant's argument that there is support for not adding binder prior to shaping in the specification, the examiner respectfully disagrees. Since the prior art discloses that adding a binder prior to shaping was known, one of ordinary skill in the art at the time of the invention would not have expected the exclusion of a binder just because of the lack of discussion or mention of a binder by applicant. Lack of comment is not the same as exclusion, and therefore a limitation requiring the specific exclusion of the binder is found to be new matter.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Royston whose telephone number is 571-270-7654. The examiner can normally be reached on M-Th 8:00am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on (571) 272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1791

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/E. R./

Examiner, Art Unit 1747

/Richard Crispino/

Supervisory Patent Examiner, Art Unit 1747